

WHAT IS CLAIMED IS:

1. A stable modified metal oxide sol which contains from 2 to 50 wt%, as calculated as metal oxides, of particles (c) comprising colloidal particles (a) of a metal oxide having primary particle diameters of from 2 to 60 nm, as nuclei, and a coating material (b) consisting of colloidal particles of an acidic oxide coated on the surface of the particles (a), and which has primary particle diameters of from 2 to 100 nm.
- 10 2. The modified metal oxide sol according to Claim 1, wherein the metal oxide as the nuclei is an oxide of at least one metal selected from the group consisting of Ti, Fe, Cu, Zn, Y, Zr, Nb, Mo, In, Sn, Sb, Ta, W, Pb, Bi and Ce.
- 15 3. The modified metal oxide sol according to Claim 1, wherein the acidic oxide to be used for the coating material (b), is antimony oxide.
4. The modified metal oxide sol according to Claim 1, wherein the coating material (b) is a diantimony pentoxide colloid containing an alkali component.
- 20 5. The modified metal oxide sol according to Claim 4, wherein the coating material (b) contains an alkali component consisting of an alkylamine, and has a M/Sb₂O₅ molar ratio (wherein M is an amine molecule) of from 0.02 to 4.00.
- 25 6. The modified metal oxide sol according to Claim 1, wherein the coating material (b) further contains an

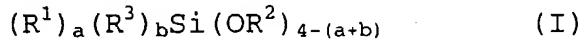
alkylamine-containing silica.

7. A process for producing the modified metal oxide sol as defined in Claim 1, which comprises mixing an aqueous sol containing the collidal particles (a) of a metal oxide as nuclei, and an aqueous sol containing the coating material (b), in a weight ratio of (b)/(a) of from 0.01 to 1 as calculated as metal oxides, and heating the aqueous medium.

8. A process for producing the modified metal oxide sol as defined in Claim 1, which comprises mixing an aqueous sol containing the collidal particles (a) of a metal oxide as nuclei, and an aqueous solution of a water-soluble alkali antimonate as the coating material (b), in a weight ratio of (b)/(a) of from 0.01 to 1 as calculated as metal oxides, and heating the aqueous medium, followed by cation exchange.

9. A coating composition comprising the following components (A) and (B):

component (A): at least one silicon-containing substance selected from the group consisting of organic silicon compounds of the formula (I):



wherein each of R^1 and R^3 is an alkyl group, an aryl group, a halogenated alkyl group, a halogenated aryl group, an alkenyl group, or an organic group having an epoxy group, an acryloyl group, a methacryloyl group, a mercapto group, an amino group or a cyano group, which is

bonded to the silicon atom by a Si-C bond, R^2 is a C_{1-8} alkyl group, an alkoxyalkyl group or an acyl group, and each of a and b is an integer of 0, 1 or 2, provided that $a+b$ is an integer of 0, 1 or 2, and the formula (II):

$$5 \quad [(R^4)_c Si(OX)_{3-c}]_2 Y \quad (II)$$

wherein R⁴ is a C₁₋₅ alkyl group, X is a C₁₋₄ alkyl group or an acyl group, Y is a methylene group or a C₂₋₂₀ alkylene group, and c is an integer of 0 or 1, and their hydrolyzates; and

10 component (B): colloidal particles of a modified
metal oxide which have primary particle diameters of from
2 to 100 nm and which contain particles (c) comprising
colloidal particles (a) of a metal oxide having primary
particle diameters of from 2 to 60 nm, as nuclei, and a
15 coating material (b) consisting of colloidal particles of
an acidic oxide coated on the surface of the particles
(a).

10. The coating composition according to Claim 9, wherein
the component (A) is at least one silicon-containing
20 substance selected from the group consisting of the
organic silicon compounds of the formula (I) and their
hydrolyzates.

11. The coating composition according to Claim 9, wherein
the metal oxide to be used for the nuclei of the
25 component (B) is an oxide of at least one metal selected
from the group consisting of Ti, Fe, Cu, Zn, Y, Zr, Nb,
Mo, In, Sn, Sb, Ta, W, Pb, Bi and Ce.

12. The coating composition according to Claim 9, wherein the acidic oxide to be used for the coating material (b) of the component (B), is antimony oxide.
13. The coating composition according to Claim 9, wherein 5 the coating material (b) of the component (B) is a diantimony pentoxide colloid containing an alkali component.
14. The coating composition according to Claim 13, wherein the coating material (b) of the component (B) 10 contains an alkali component consisting of an alkylamine, and has a M/Sb₂O₅ molar ratio (wherein M is an amine molecule) of from 0.02 to 4.00.
15. The coating composition according to Claim 9, wherein the coating material (b) of the component (B) further 15 contains an alkylamine-containing silica.
16. The coating composition according to Claim 9, which contains at least one curing catalyst selected from the group consisting of metal salts, metal alkoxides and metal chelates.
- 20 17. An optical element which comprises an optical substrate and a cured film made of the coating composition as defined in Claim 9 formed on the surface of the optical substrate.
18. The optical element according to Claim 17, which 25 further has an antireflection film formed on its surface.